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ABSTRACT:

PURPOSE: To connect data communication equipment to a LAN, to recognize information on notice and transfer to a terminal on the LAN when data from a transmission-side is received and to improve operability.

CONSTITUTION: Management information at the time of reception-notifying another terminal of data received from a cable communication line 120 or a radio communication line 121 through a cable LANi/f 122 or radio LANi/f123 or at the time of transferring received data is accumulated in RAM 103.

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#### DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a data communication unit especially connectable with LAN about the data communication unit which communicates data.

[0002]

[Description of the Prior Art] Conventionally, a data communication unit, for example, facsimile apparatus, is connected to LAN, when the data with which facsimile apparatus was sent from the transmitting side are received, it notifies that there was reception to information processing terminals, such as a personal computer on LAN, or what transmits the received data is known.

[0003] Moreover, in the usual facsimile apparatus, the transmitting agency telephone number, arrival-of-the-mail time amount, and the receiving result information of receiving number of sheets are memorized, and what outputs receiving result information by actuation of an operator etc. is common.

[0004]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, the information whether it notified that there was reception of data and whether received data were transmitted had the trouble that it could not recognize.

[0005] This invention was made in view of the above-mentioned trouble, and aims at offering the data communication unit for aiming at improvement in the user-friendliness at the time of connecting a data communication unit to LAN.

[0006]

[Means for Solving the Problem and its Function] In order to attain the above-mentioned purpose, the data communication unit of this invention is equipped with the following configurations. Namely, the connecting means for connecting with LAN and a receiving means to receive the data from a transmitting side, A notice means to notify having received with said receiving means to the terminal on said LAN, It has a notice place storage means to memorize the data showing the terminal which should be notified with said notice means, a notice hysteresis storage means to memorize the hysteresis in connection with the notice by said notice means, and an output means to output the contents memorized for said notice place storage means and said notice hysteresis storage means. According to this, the information on the notice place which notifies reception of data, and the information in connection with this notice can be recognized.

[0007] Moreover, the connecting means for connecting with LAN and a receiving means to receive the data from a transmitting side, The data received with said receiving means to the terminal on said LAN A transfer means, It has a destination storage means to memorize the data showing the terminal which should be transmitted with said transfer means, a transfer hysteresis storage means to memorize the hysteresis in connection with the transfer by said transfer means, and an output means to output the contents memorized for said destination storage means and said transfer hysteresis storage means. According to this, the information on the destination of received data and the information in connection with this transfer can be recognized.

[0008]

[Example] Hereafter, one example of this invention is explained to a detail with reference to a drawing.

[0009] (The 1st example) Drawing 1 is the block diagram showing the configuration of the facsimile apparatus which is one example of this invention.

[0010] In this drawing, CPU101 is the system control section and controls the whole equipment.

[0011] ROM102 stores the control program of CPU.

[0012] RAM103 is for consisting of SRAM etc. and storing a program control variable

etc. Moreover, the set point, the management data of equipment, etc. and the various buffers for work pieces which the operator registered are also stored in RAM.

[0013] The recording memory 104 consists of DRAMs etc., and accumulates image data.

[0014] The resolution transform-processing section 105 performs resolution conversion control of milli inch conversion of raster data etc.

[0015] The coding decryption processing section 106 for a communication link encodes to a communication link, when the coding method at the time of reading and record differs from the coding method at the time of a communication link.

[0016] Reading / coding decryption processing section 107 for record performs coding of image data, and decryption processing at the time of reading and record.

[0017] MODEM108 performs the strange recovery of the transceiver signal of facsimile, and NCU109 has the function which sends out a selection signal (tires RUPARUSU or tone dialer) to the radio circuit 121 through the wire communication circuit 120 or wireless circuit i/f 118 through wire-circuit i/f 117, and it also performs automatic incoming connection actuation by call sound detection.

[0018] A cable / wireless line control section 119 performs control of wire-circuit i/f 117 and wireless circuit i/f 118.

[0019] A scanner 111 consists of CS image sensors, a manuscript conveyance device, etc., and a manuscript is read optically and it changes it into electric image data.

[0020] The image-processing section 110 performs amendment processing to the read image data, and outputs high definition image data.

[0021] A control unit 112 is to consist of keyboards etc. and for an operator perform various alter operation.

[0022] The external display 113 is for giving a display notice by LCD, LED, etc. at a user.

[0023] In case the printer formatter 114 prints the file data from a workstation etc., it analyzes a printer description language and changes it into image data.

[0024] A printer 115 is equipment which records a receiving image and file data on the recording paper.

[0025] Cable LANi/f122 is an interface for wireless LANi/f123 to connect facsimile apparatus to a cable LAN 125 at wireless LAN 126, and cable LANi/f122 and wireless LANi/f123 are controlled by the cable / wireless LAN control section 124.

[0026] The LAN control section 116 processes data, in order to perform transfer of the server on Cable LAN or wireless LAN or a terminal, and data.

[0027] Drawing 2 is the schematic diagram showing an example of the topology of the facsimile apparatus shown in drawing 1.

[0028] 201 is the facsimile apparatus shown in drawing 1, and is facsimile apparatus connectable with a direct cable and wireless LAN.

[0029] 202 is a server machine of LAN to which this facsimile apparatus is connected, and manages the file on LAN and LAN.

[0030] 203 and 204 are the client machines (information processing terminal) connected to the cable LAN 125.

[0031] It is the printer server which performs control which 205 receives the print request from a client machine, and is outputted to a printer, and 206 is a printer which outputs print image data.

[0032] 207 is the client machine installed in wireless LAN 126.

[0033] 208 is facsimile which communicates with facsimile apparatus 201 through the telephone line 120.

[0034] 209 is a base transceiver station and communicates facsimile through facsimile apparatus 201 and the wireless circuit 121.

[0035] 210 is a line network and performs the communication link by the telephone line 120 which has connected facsimile and a base transceiver station to a line network 210.

[0036] Drawing 3 is drawing having shown the DS of the field for holding the communication management information on the facsimile apparatus 201 in this example. In addition, communication management information is arranged at RAM103 of drawing 1 so that the information for 40 communication links can be held in total. If the number of communication links exceeds 40, it is overwritten sequentially from the old thing. Moreover, each communication management information consists of fields of 301 to 312, respectively, as shown in this drawing.

[0037] The communication management number 301 is a field holding the management number for identifying each communication link.

[0038] The phase hand telephone number 302 is a field holding the telephone numbers of the phase hand about each communication link, such as the telephone number notified in the procedure of a facsimile transmission through the communication line, the telephone number inputted by the user at the time of transmission, or the telephone number of the destination chosen by the user at the time of transmission.

[0039] The phase hand abbreviated name 303 is a field holding abbreviated names of the phase hand about each communication link, such as an abbreviated name notified in the procedure of a facsimile transmission through the communication line, or an abbreviated name of the destination chosen by the user of a transmitting side at the time of transmission.

[0040] The communication link classification 304 is a field holding the information for classifying the class of each communication link which consists of elements in which it is shown to LAN whether it is the communication link accompanied by the transfer request of the upper client machine in addition to elements, such as transmission, reception, polling, the multiple address, confidential, junction, memory, a timer, hand control, and automatic.

[0041] The communication link start time 305 is a field holding the start time of each communication link.

[0042] The communication link time amount 306 is a field for holding the duration of each communication link.

[0043] The communication link result 307 is a field holding the information on whether each communication link was completed normally.

[0044] Pagination 308 is a field holding the number of the pages normally transmitted by each communication link.

[0045] In addition, when the facsimile communications processing of transmission or reception is completed, suitable data are automatically written in each above field of 301 to 308.

[0046] A transfer time 309 is effective only when the corresponding communication link is accompanied by the transfer request to the client machine on LAN, and when a transfer of the image to the demanded client machine is completed, it is a field which holds time

of day when a transfer is performed to the client machine of the vicarious execution place which the transfer to the demanded client machine was not completed, but was beforehand defined for every client machine.

[0047] The destination name 310 is effective only when the corresponding communication link is accompanied by the transfer request to the client machine on LAN, and it is a field holding the name of the demanded client machine.

[0048] The vicarious execution place name 311 is a field holding the name with which it is used when the corresponding communication link is accompanied by the transfer request to the client machine on LAN and a transfer is performed at the vicarious execution place which it was effective, and the transfer to the demanded client machine was not completed, but each client machine was made to correspond beforehand, and was defined, and the client machine of the vicarious execution place is expressed.

[0049] The reply time of day 312 is effective only when the corresponding communication link is accompanied by the transfer request to the client machine on LAN, and it is a field holding the time of day when answering the facsimile apparatus of a transmitting agency through a communication line in the purport which the transfer to the demanded client machine or the client machine of a vicarious execution place defined beforehand completed.

[0050] In addition, each above field of 309 to 312 is automatically initialized, when the facsimile communications processing of transmission or reception is completed.

[0051] Drawing 4 is the flow chart which described processing of renewal of the field about a transfer of a receiving image, and a transfer of communication management information in the detail.

[0052] First, in step S401, it judges whether a receiving image exists. If a receiving image exists, it will progress to step S402, otherwise, step S401 is repeated.

[0053] At step S402, it judges whether the receiving image judged in step S401 is a thing accompanied by the transfer request to the client machine on LAN. If a receiving image is accompanied by the transfer request to the client machine on LAN (i.e., if the data in which the transfer request to the client machine on LAN is shown are written in the contents of the communication link classification 304 of drawing 3 held with termination of reception as mentioned above), it will progress to step S403, otherwise, will return to step S401. For example, if the communication management number 301 shown in drawing 3 is the communication link of 0001 and 0002, it will progress to step S403, and if the communication management number 301 is the communication link of 0003, it will return to step S401.

[0054] At step S403, the name which expresses with the procedure of a facsimile transmission etc. client machine \*\* of the destination demanded from the transmitting side is saved at the destination name 310 of drawing 3, and it progresses to step S404. For example, if the communication management number 301 shown in drawing 3 is the communication link of 0001, it is the client name of the destination where "yukio\_a" was demanded.

[0055] Next, in step S404, \*\* is judged [ whether a transfer of an image is possible, and ] to the client machine of the demanded destination. If possible, it will progress to step S405.

[0056] At step S405, a receipt is performed to the client machine of the demanded destination, and this image data is transmitted through LAN, and if a transfer is

completed, it will progress to step S406.

[0057] At step S406, the time of day which the transfer completed is saved at the transfer time 309 of drawing 3 , and it returns to step S401.

[0058] By the reasons nil why the demanded power source of the client machine of the destination is off in step S404 on the other hand etc., if judged with a transfer of an image being impossible, it will progress to step S407.

[0059] At step S407, \*\* is judged [ whether a vicarious execution transfer of this image data is possible, and ] to the client machine of the vicarious execution place which is referred to at the client machine of the demanded destination when a transfer of an image is impossible and which was defined beforehand. If possible, it will progress to step S408, otherwise, it returns to step S401.

[0060] At step S408 By the same approach as step S405, a receipt is performed to the client machine of the vicarious execution place of the client machine of the demanded destination, and this image data is transmitted through LAN, and if a transfer is completed, it will progress to step S409.

[0061] At step S409, the name of a vicarious execution place is saved at the vicarious execution place name 311 of drawing 3 , and it progresses to step S406. For example, if the communication management number 301 shown in drawing 3 is the communication link of 0002, the transfer to the client "nokku\_y" of the demanded destination cannot be performed, but it means that the vicarious execution transfer was carried out at "ryutaro\_k" of a vicarious execution place.

[0062] At the above step, the field about a transfer of communication management information is updated.

[0063] Drawing 5 is the flow chart which described processing of renewal of the field about the reply to a transmitting agency, and the reply of communication management information in the detail. This processing is performed by asynchronous with the processing of a transfer of a receiving image to the demanded client machine which was shown in drawing 4 .

[0064] First, in step S501, the image data transfer to the demanded client machine or vicarious execution place client machine is completed, and it judges whether the event of the waiting for a reply in which the facsimile apparatus of a transmitting agency must be told about that exists in a reply queue. If the event of the waiting for a reply exists, it will progress to step S502, otherwise, step S501 is repeated.

[0065] At step S502, processing of the reply to the facsimile apparatus of a transmitting agency is started. In step S503, it waits to complete a reply.

[0066] If a reply is completed, it will progress to step S504, and it judges whether reply processing was successful. If it succeeds, it will progress to step S505, otherwise, it returns to step S501.

[0067] At step S505, the time of day which the reply completed is saved at the reply time of day 312 of drawing 3 , and it progresses to step S506.

[0068] At step S506, this reply event is deleted from a reply queue, and it returns to step S501.

[0069] At the above step, the field about the reply of communication management information is updated.

[0070] Drawing 6 is the flow chart which showed printing processing of a communication management report. This processing is performed, when a user's

operation receives the demand of communication management report printing, or when the communication management information with which printing cannot be managed collects by 40 communication links.

[0071] First, in step S601, communication management information as shown in drawing 3 arranged on RAM103 of drawing 1 is read, and it progresses to step S602.

[0072] At step S602, it fabricates in order to print the read communication management information, and it progresses to step S603 at it.

[0073] At step S603, delivery and a communication management report are printed for the fabricated communication management information to a printer 115 through the printer formatter 114 of drawing 1, and printing processing of a communication management report is ended.

[0074] A communication management report is printed at the above step.

[0075] An example of the printing result of a communication management report is shown in drawing 7.

[0076] From this printing result, a user can know the following things.

[0077] (1) It turns out that the transfer of an image [as opposed to the client machine of pinpointing / the communication link of 0001, 0002, and 0005 / on / the item of communication link classification to / LAN in a communication management number ] is demanded.

[0078] (2) It turns out that it is the facsimile communication which the communication management number is not demanding in the transfer to the client machine of pinpointing [ the communication link of 0003 and 0004 ] on [ the item of communication link classification to ] LAN.

[0079] (3) A communication management number is [ the client name of the item of a destination name to the destination ] "yukio\_a", a transfer of an image is completed from the item of a transfer time to '95.04 / 0110:15:24, and the communication link of 0001 is '95.04/01 from the item of reply time of day. It turns out that a letter was answered in the purport of the completion of a transfer to transmitting agency facsimile apparatus 10:20:31.

[0080] (4) Although the client name of the item of a destination name to the destination is "nokku\_y", a communication management number the communication link of 0002 A transfer is impossible in a certain reason, "ryutaro\_k" is chosen from a same clause eye as a vicarious execution place, and it is '95.04/01 from the item of a transfer time. Although the vicarious execution transfer of an image was completed to 10:42:17 The item of reply time of day shows having not answered a letter yet in the purport of the completion of a vicarious execution transfer to transmitting agency facsimile apparatus.

[0081] (5) Although a communication management number is [ the client name of the item of a destination name to the destination ] "tomil\_m", as for the communication link of 0005, it turns out that the transfer of an image is not performed yet at least from the item of a transfer time.

[0082] (Other examples) Although it described that the communication management information fabricated at step S602 printed delivery and a communication management report to a printer 115 through the printer formatter 114 of drawing 1 in step S603 of drawing 6 in the 1st above-mentioned example If it changes so that it may send to the specific client machine to which the fabricated communication management information was beforehand set through LAN at this step, the facsimile apparatus which can deliver a

communication management report not as space but as electronized information can be built easily.

[0083] Moreover, if it changes into the field of the transfer hysteresis holding whether the transfer only completed the field of a transfer time, although it is identifying whether the transfer was completed or not in the 1st example by whether the field of a transfer time 309 is prepared as shown in drawing 3, and time information effective in this field is written in, and amount of information will decrease a little, the facsimile apparatus which has the same effectiveness by small RAM capacity can be built.

[0084] Moreover, if it changes into the field of the reply hysteresis holding whether the reply only completed the field of reply time of day, although it is identifying similarly whether the reply was completed or not in the 1st example by whether the field of the reply time of day 312 is prepared as shown in drawing 3, and time information effective in this field is written in, and amount of information will decrease a little, the facsimile apparatus which has the same effectiveness by small RAM capacity can be built.

[0085] Furthermore, although it consists of the 1st example so that the LAN control section 116, the cable / wireless LAN control section 124, cable LANi/f122, and wireless LANi/f123 may be held in the interior of facsimile apparatus in order to carry out direct continuation to LAN as shown in drawing 1 Information processing terminals, such as the so-called personal computer, are made to substitute for this part, and if the interface means for connecting with an information processing terminal at facsimile apparatus is held, facsimile apparatus with the cheaper and same effectiveness can be offered.

[0086] Furthermore, although the 1st example described the facsimile apparatus which transmits a receiving image to the specific client machine on LAN The transfer time 309 and the destination name 310 of drawing 3 are made into the field of notice time of day and a notice place name, respectively. Step S405 and step S408 of drawing 4 are changed so that only the notice of the purport which only had reception may be given. Read "a transfer" described by this drawing as "a notice", and a receiving image is not transmitted to the specific client machine on LAN. The purport which only had reception is notified to the specific client machine on LAN, and you may enable it to pull out received data by actuation of the operator of a client machine.

[0087] Moreover, it cannot be overemphasized that it does not depend for this invention on the class of LAN.

[0088] Furthermore, although the 1st example described that the information about a transfer is managed with a communication management report, and it records, even if it manages the information about a transfer of a receiving image independently and records it, it is completely satisfactory.

[0089] Furthermore, although the example 1 has described for the encoded common facsimile image, this invention can be used even if it is a transfer and notice of the binary data transmitted in the BFT mode of an ITU-T recommendation etc.

[0090] Furthermore, although communication management information has composition which is overwritten from an old thing if it exceeds 40 communication links, it may be made to carry out sequential elimination from what transmitted to the client and answered the transmitting agency in the transfer result. Drawing 8 is explained about this. If there is a new communication link, it will judge whether communication management information exceeded 40 communication links (801). When it is not over 40 communication links, communication management information is accumulated until it



becomes 40 communication links. When it is over 40 communication links, the oldest communication management information is retrieved (802) and the following items are checked.

[0091] First, the file applicable to the communication management information confirms whether to be the file transmitted to a client machine. What is necessary is just to judge this by the existence of the destination name shown in drawing 3. When there is no destination name (i.e., when it is not the file transmitted to a client machine), the communication management information is eliminated and the newest communication management information is memorized (S806). On the other hand, when there is a destination name, in the case of the file transmitted to a client machine, it judges whether it is finishing [ the transfer to a client machine ] next (S804). What is necessary is just to judge this by the existence of a transfer time. When there is a transfer time, it judges whether transmitting-to degree origin was answered in the transfer result (S805). What is necessary is just to judge this by the existence of reply time of day. When finishing [ a reply ], the communication management information is eliminated, the newest communication management information is memorized (806). The finishing transfer on the other hand or communication management information that it is next old when it is not reply settled is extracted, and it is \*\*\*\*\* about the same processing. The file which corresponds to a client machine by this is transmitted, and answering transmitting [ the transmitted result ] origin comes to be able to ensure it.

[0092] Although (805) is judged for whether it is finishing [ be / it / finishing / a transfer / (804) and a reply ] by time of day here, apart from this, items, such as a transfer settled, transfer failure, un-transmitting, a reply settled, reply failure, and un-answering a letter, may be established as another item. This can inform an operator certainly also at the times, such as transfer failure and reply failure. Furthermore, when one does not have the communication management information to eliminate, since the communication link after it is not certainly manageable, it is desirable to make it not receive a communication link.

[0093] a \*\*\*\*\* [ that, as for facsimile apparatus 201, the receiving image was transmitted according to these examples as explained above ] -- or a \*\*\*\*\* [ that the purport of reception was notified ] -- \*\* -- it becomes possible to deliver the said information in space at printing or a specific client.

[0094] Thereby, using the information printed or delivered, a manager or a user can know now to preparation existence of the image of the transfer which occupies memory, or notice waiting, and he not only can obtain now a transfer of a receiving image, and the detailed information of a notice, but can demand memory freeing etc. now from the user corresponding to the client of the destination or the notice place which occupies memory directly if needed. For this reason, memory is efficiently manageable.

[0095]

[Effect of the Invention] The information about the notice and transfer to the terminal on LAN at the time of connecting a data communication unit to LAN like according to this invention, and receiving the data from a transmitting side explained above can be recognized, and improvement in user-friendliness can be aimed at.

## CLAIMS

[Claim 1] The connecting means for connecting with LAN, and a receiving means to receive the data from a transmitting side, A notice means to notify having received with said receiving means to the terminal on said LAN, A notice place storage means to memorize the data showing the terminal which should be notified with said notice means, The data communication unit characterized by having a notice hysteresis storage means to memorize the hysteresis in connection with the notice by said notice means, and an output means to output the contents memorized for said notice place storage means and said notice hysteresis storage means.

[Claim 2] It is the data communication unit according to claim 1 which notifies said notice means to the vicarious execution terminal beforehand set up for every terminal when it cannot notify to the terminal which should be notified, and is characterized by said notice place storage means memorizing the data showing the terminal and vicarious execution terminal which should be notified.

[Claim 3] Furthermore, it is the data communication unit according to claim 1 which has a reply means having notified having received with said receiving means to the terminal on said LAN, and to answer said transmitting side, and a reply hysteresis storage means to memorize the hysteresis in connection with the reply of said reply means, and is characterized by for said output means to output the contents further memorized for said reply hysteresis storage means.

[Claim 4] The connecting means for connecting with LAN, and a receiving means to receive the data from a transmitting side, The data received with said receiving means to the terminal on said LAN A transfer means, A destination storage means to memorize the data showing the terminal which should be transmitted with said transfer means, The data communication unit characterized by having a transfer hysteresis storage means to memorize the hysteresis in connection with the transfer by said transfer means, and an output means to output the contents memorized for said destination storage means and said transfer hysteresis storage means.

[Claim 5] It is the data communication unit according to claim 4 which transmits said transfer means to the vicarious execution terminal beforehand set up for every terminal when it cannot transmit to the terminal which should be transmitted, and is characterized by said destination storage means memorizing the data showing the terminal and vicarious execution terminal which should be transmitted.

[Claim 6] Furthermore, it is the data communication unit according to claim 4 which has a reply means having transmitted the data received with said receiving means to the terminal on said LAN, and answer said transmitting side, and a reply hysteresis storage means memorize the hysteresis in connection with the reply of said reply means, and is characterized by for said output means to output the contents further memorized for said reply hysteresis storage means.

[Claim 7] Claim 1 characterized by including the data of whether processing was completed in said hysteresis, or a data communication unit according to claim 4.

[Claim 8] Claim 1 characterized by containing time-of-day data in said hysteresis, or a data communication unit according to claim 4.